

**PATTERNING METHODS AND SYSTEMS USING  
REFLECTED INTERFERENCE PATTERNS**

**Related Applications**

The present application is a continuation of and claims the benefit of priority from U.S. Application Serial No. 09/781,881 filed February 12, 2001, which claims the benefit of priority from U.S. Provisional Application Serial No. 60/185,288 filed February 28, 2000. The disclosures of Application Serial Nos. 09/781,881 and 60/185,288 are hereby incorporated herein in their entirety by reference.

-- now U.S. Patent  
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**Background of the Invention**

10 The present invention relates to the field of microelectronics and more particularly to microelectronic patterning.

As integrated circuit devices become more highly integrated, dimensions of structures such as conductive lines and via holes and spaces therebetween are reduced. Accordingly, patterning processes are needed for smaller patterns. In the past, conventional optical lithography techniques have been used.

In optical lithography, an image of a pattern is optically projected onto a substrate by transmitting radiation through a mask including the pattern thereon. In essence, a pattern from a mask is projected onto a photosensitive material which is then developed so that the developed photosensitive material has the pattern of the mask. As the dimensions of microelectronic structures are further reduced, however, mask projection techniques may limit further reductions in pattern sizes.

Accordingly, there continues to exist a need in the art for improved patterning methods and systems.

**Summary of the Invention**

According to embodiments of the present invention, a layer on a substrate can be patterned using interference patterns. For example, coherent radiation can be projected toward a reflector surface so that the